|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Validation Accuracy** | | | | |
| **Dimensions Reduced to** | **32** | **64** | **128** | **256** |
| Architecture 1:-  (64-32-16) | 98.23 | 98.55 | 98.39 | 98.13 |
| Architecture 2:-  (32-16-8) | 97.99 | 98.18 | 97.86 | 97.73 |
| Architecture 3:-  (128-64-32) | 98.03 | 98.36 | 98.41 | 97.89 |

TASK-3

1 Hidden Layers

TASK-4

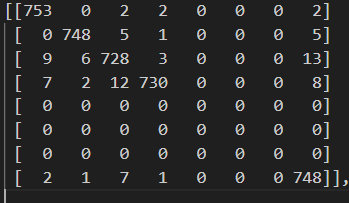
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Validation Accuracy** | | | | |
| **Dimensions Reduced to** | **32** | **64** | **128** | **256** |
| Architecture 1:-  (64-32-16) | 98.23 | 98.55 | 98.39 | 98.13 |
| Architecture 2:-  (32-16-8) | 98.16 | 98.88 | 98.35 | 97.89 |
| Architecture 3:-  (128-64-32) | 98.18 | 98.47 | 97.97 | 97.89 |

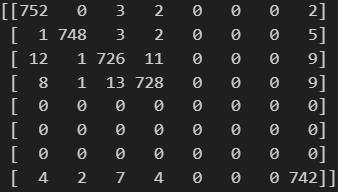
3 Hidden Layers

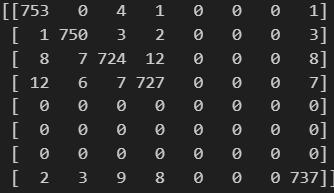
Best Architecture based on Validation Accuracy is 64-32-16.

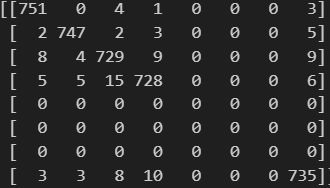
TASK-4

CM & Test Accuracy for Best Architectures [3 Hidden layer AutoEncoder]

 32 Acc:97.25

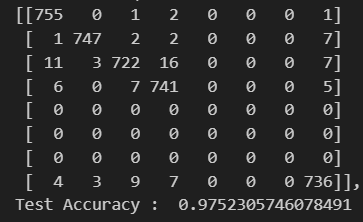
 64 Acc: 97.39

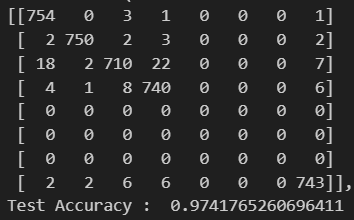
 128 Acc :97.26

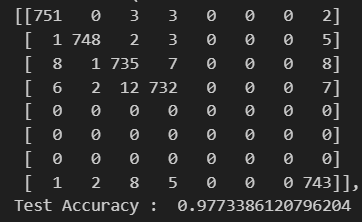
 256 Acc :97.23

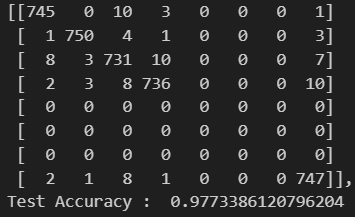
TASK-3

CM & Test Accuracy for Best Architectures [1 Hidden layer AutoEncoder]

 256

 128

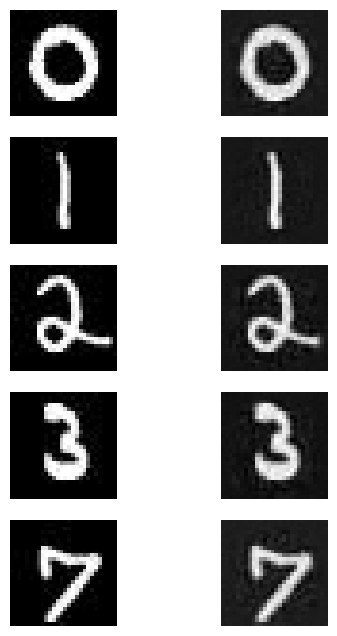
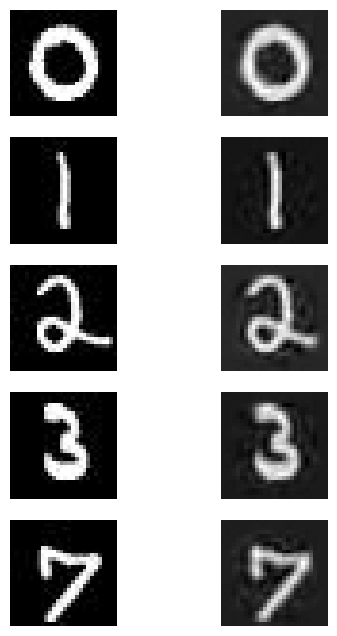
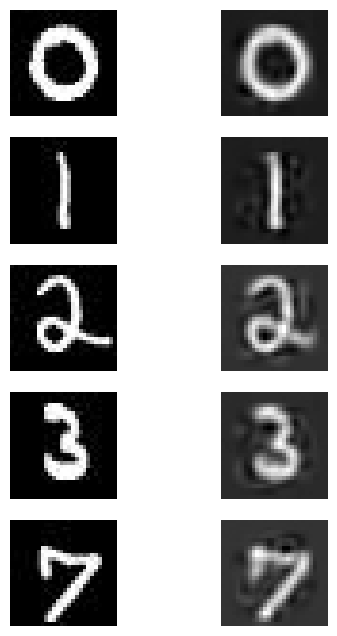
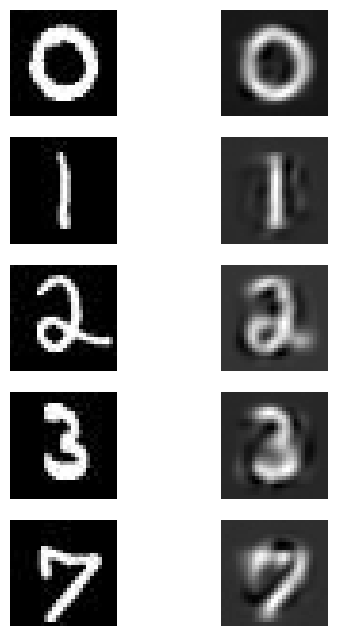
 64

 32

TASK-2

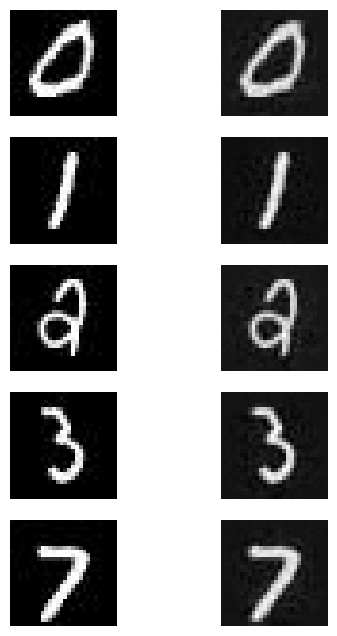
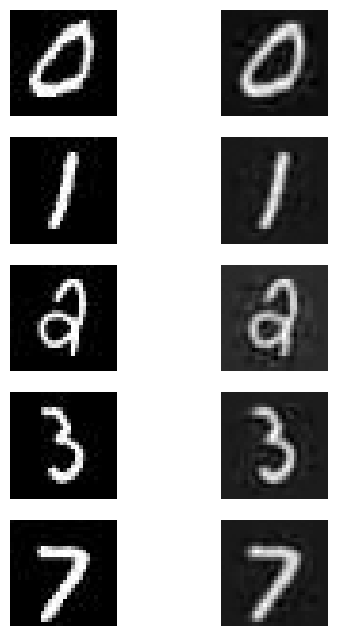
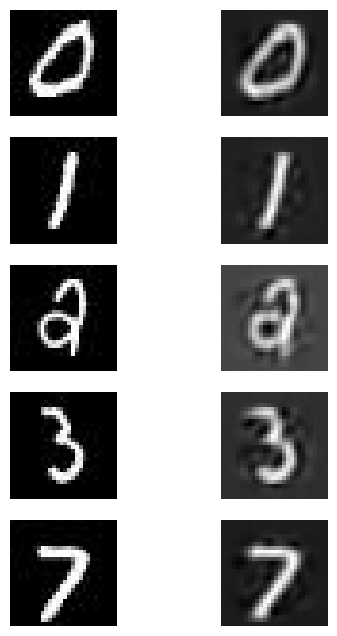
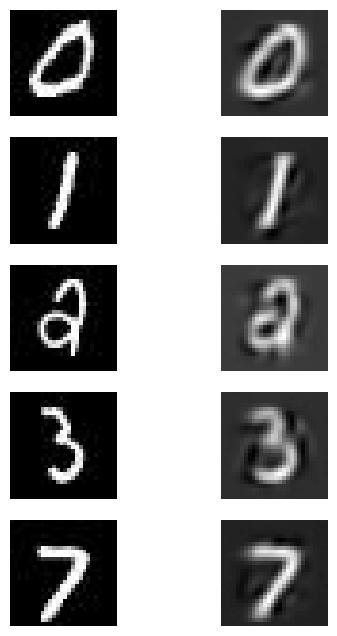
Single Hidden layer Encoder

Training Images

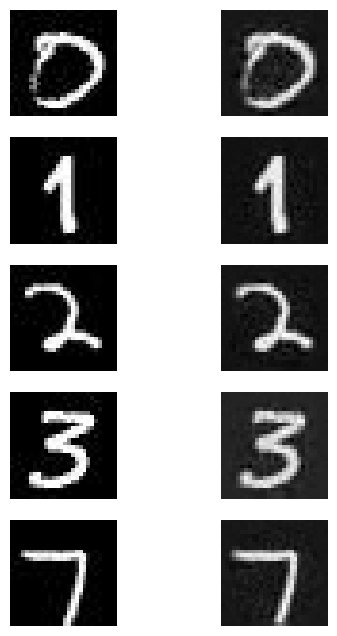
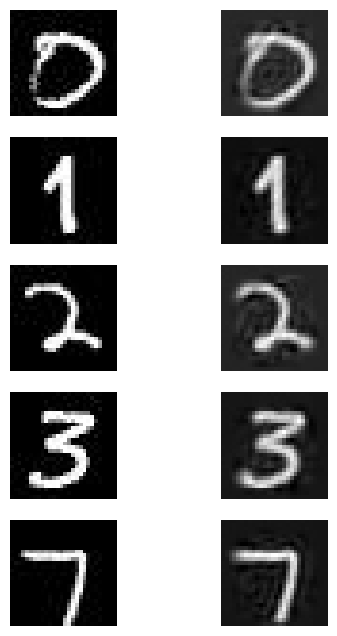
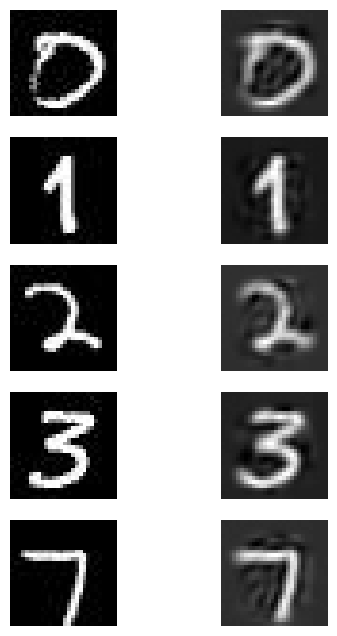
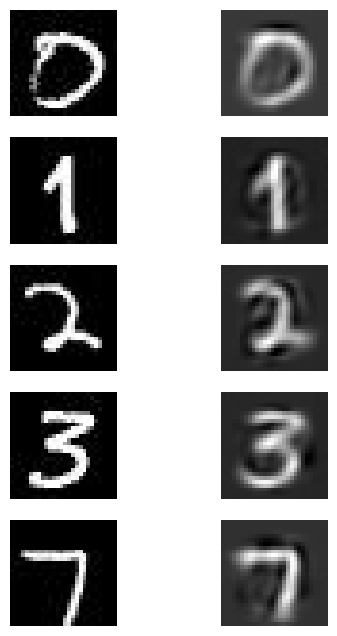
   

256 128 64 32

Validation Images

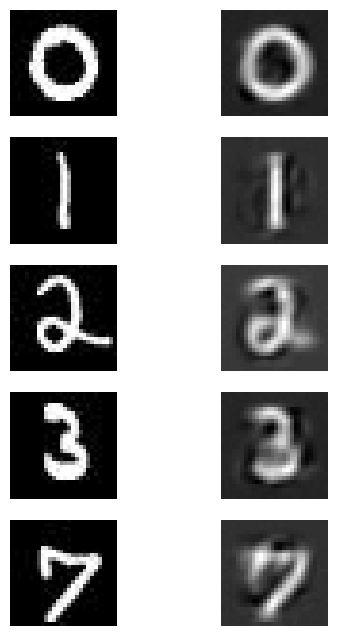
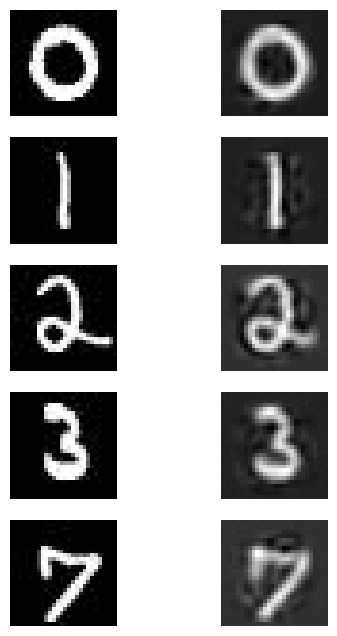
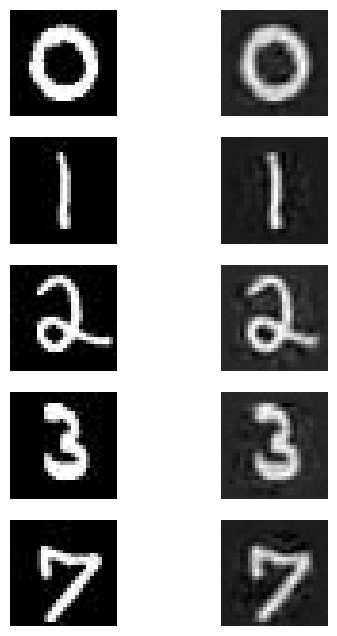
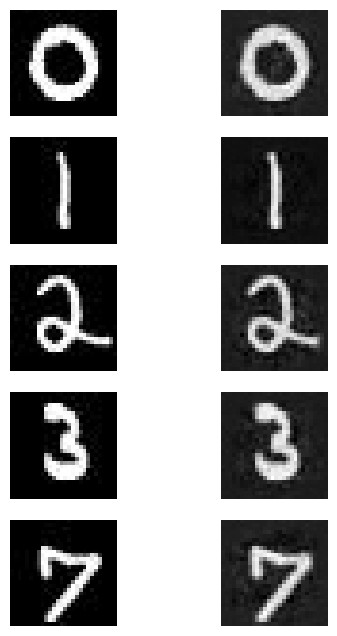
   

Test Images

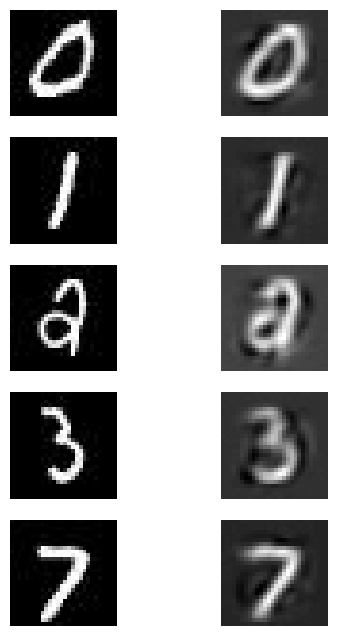
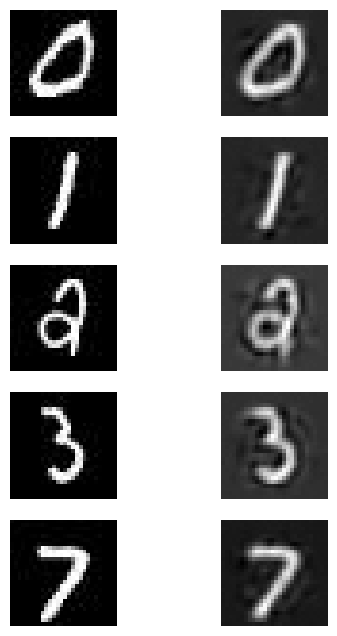
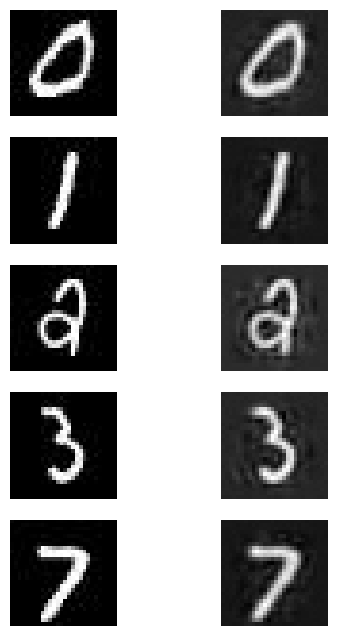
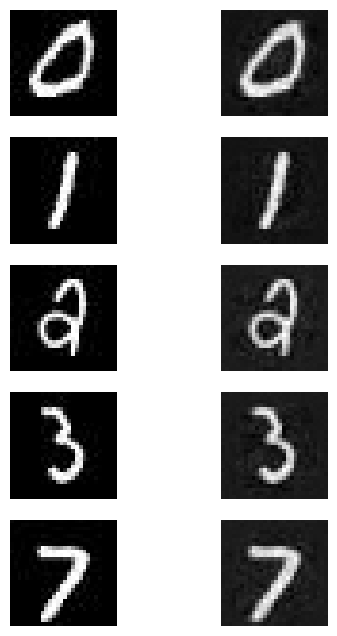
3 Hidden Layer Encoder

Training Images

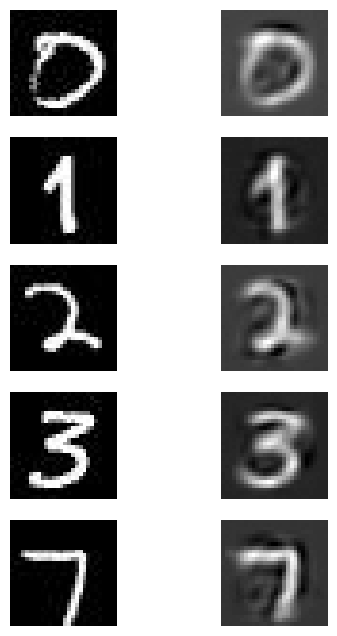
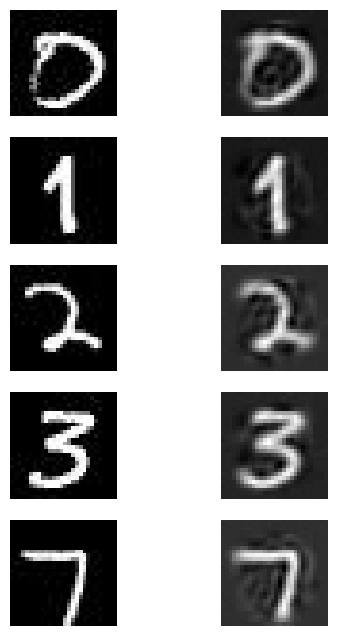
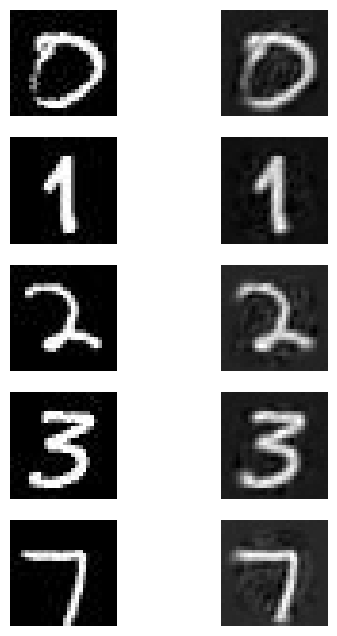
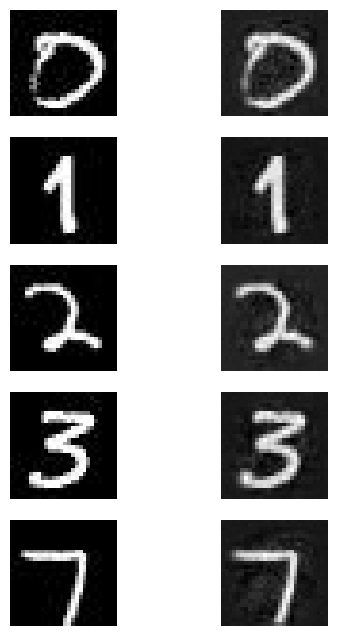
   

32 64 128 256

Validation Images

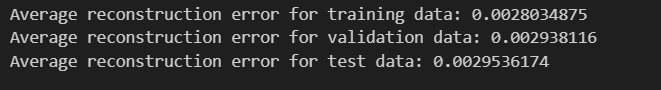
   

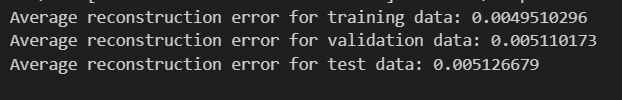
Testing Images

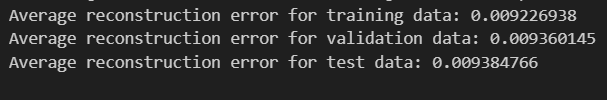
   

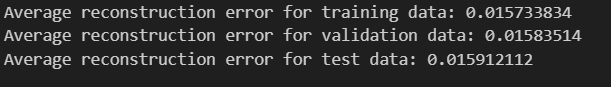
TASK 2

3 hidden layer Auto Encoder :

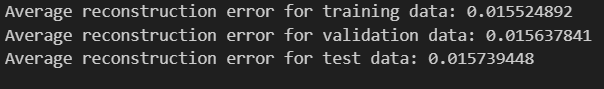
 256

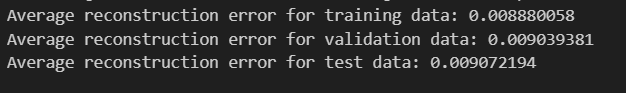
 128

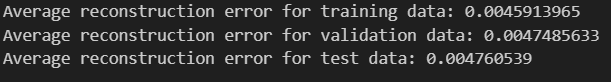
 64

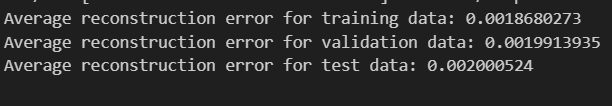
 32

1 Hidden Layer Auto Encoder

 32

 64

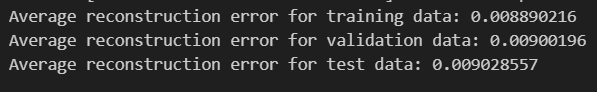
 128

 256

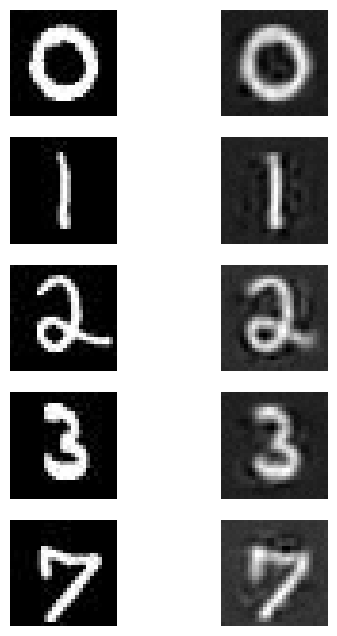
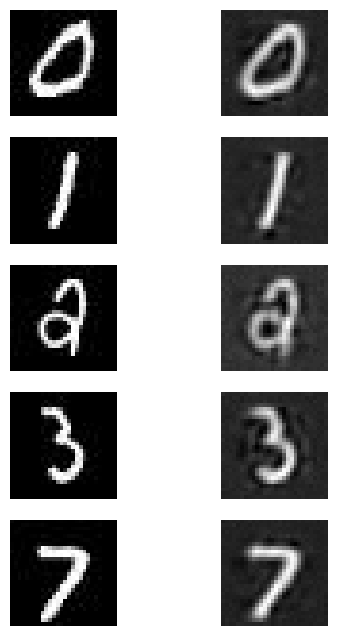
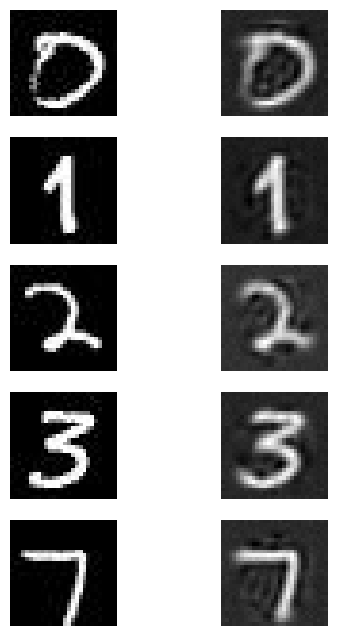
TASK 5

Based on Test accuracy best architecture of 1 Hidden layer Autoencoder was found to be the one with 64 neurons in hidden layer.

20% Noise in Input



Training Validation Testing

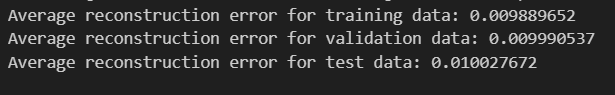
|  |  |
| --- | --- |
| **Test Dataset** | |
| **Architectures** | **64** |
| 64-32-16 | 97% |
| 32-16-8 | 98.3% |
| 128-64-32 | 97.78% |

**Classification Accuracy**

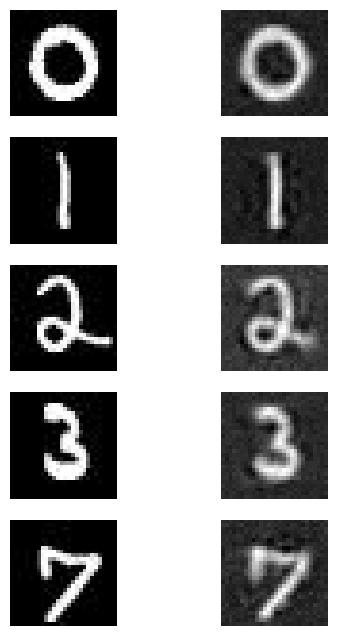
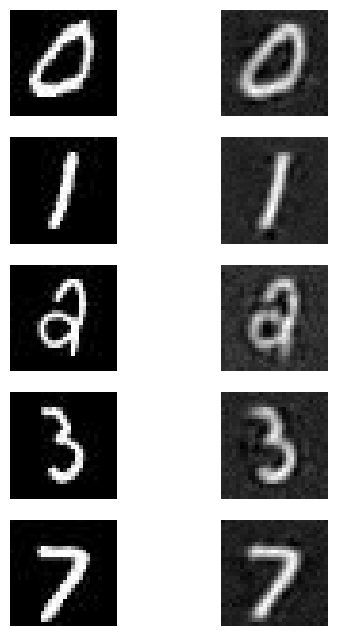
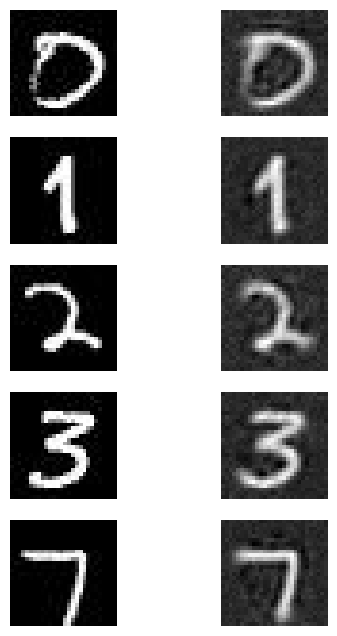
**20% noise**

|  |  |
| --- | --- |
| **Validation Dataset** | |
| **Architectures** | **64** |
| 64-32-16 | 98% |
| 32-16-8 | 98.1% |
| 128-64-32 | 98.2% |

40% Noise in Input



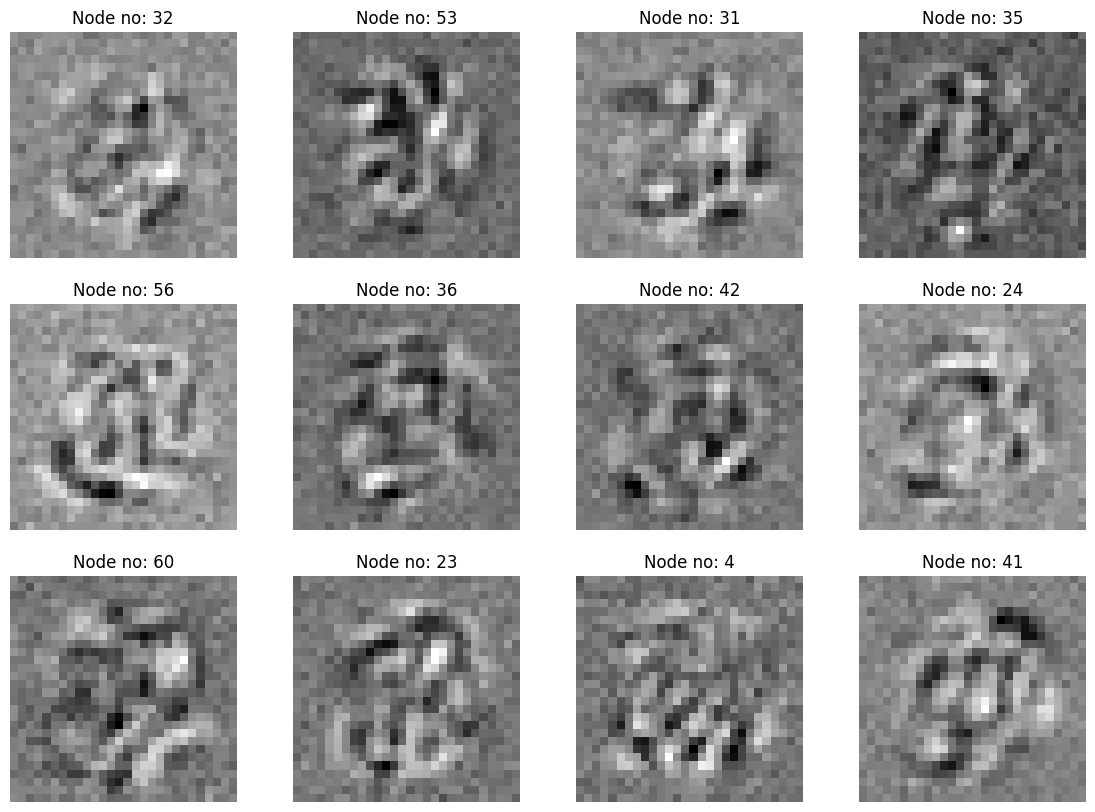
Training Validation Testing

**  **

**Classification Accuracy**

|  |  |
| --- | --- |
| **Validation Dataset** | |
| **Architectures** | **64** |
| 64-32-16 | 98.10% |
| 32-16-8 | 97.78% |
| 128-64-32 | 98.34% |

|  |  |
| --- | --- |
| **Test Dataset** | |
| **Architectures** | **64** |
| 64-32-16 | 97.54% |
| 32-16-8 | 97.42% |
| 128-64-32 | 97.86% |

****